

WEST Search History

DATE: Thursday, April 24, 2003

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DB=USPT,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ

L5 (dimer adj4 chain transfer agent) and (surfactant or emulsion polymerization)

41 L5

L4 (dimer adj4 chain transfer agent) with (surfactant or emulsion polymerization)

5 L4

L3 L2 and emulsion polymerization

11 L3

L2 dimer adj2 chain transfer agent

75 L2

DB=USPT; PLUR=YES; OP=ADJ

L1 6423804.pn.

1 L1

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L3: Entry 4 of 11

File: USPT

Apr 11, 2000

DOCUMENT-IDENTIFIER: US 6048924 A

**** See image for Certificate of Correction ****

TITLE: Aqueous resin composition and aqueous paint

Brief Summary Text (20):

(9) a water-borne resin composition according to (6), wherein water-borne resin (B) is water dispersed resin obtained by emulsion polymerization;

Brief Summary Text (21):

(10) a water-borne resin composition according to (9), wherein water-borne resin (E) is obtained by emulsion polymerization of unsaturated monomers comprising unsaturated monomer having a functional group which can react with amino resin (A);

Brief Summary Text (86):

Moreover, the present invention relates to a water-borne resin composition characterized in that the water-borne resin (B) having a functional group reactive with amino resin (A) is water-borne resin having an activated hydrogen group, and the water-borne resin (B) is water dispersed resin obtained by emulsion polymerization. More specifically, the present invention relates to a water-borne resin composition characterized in that the water-borne resin (B) is water dispersed resin obtained by emulsion polymerization of unsaturated monomers containing unsaturated monomer having a functional group which can react with amino resin (A).

Brief Summary Text (87):

In addition, concretely, when the water-borne resin (B) of the present invention is water dispersed resin particularly obtained by emulsion polymerization, unsaturated monomer having a functional group which can react with amino resin (A) preferably comprise N-alkoxyalkyl substituted amide group, N-alkoxyalkyl group, N-methylol group, carboxyl group, or hydroxyl group.

Brief Summary Text (88):

There are no particular limitations placed on unsaturated monomer used in water-borne resin (B) obtained by emulsion polymerization of unsaturated monomers containing unsaturated monomer having a functional group which can react with amino resin (A).

Brief Summary Text (96):

From the points of view of stability of water dispersed resin in emulsion polymerization, storage stability of desired water-borne resin composition, unsaturated monomers having hydroxyl group and/or unsaturated monomers having N-alkoxymethyl group are preferably used.

Brief Summary Text (97):

A ratio of unsaturated monomers having a functional group reactive with amino resin (A) in unsaturated monomers is preferably 3 to 70 weight parts, more preferably 5 to 50 weight parts against 100 weight parts of unsaturated monomers. When unsaturated monomers having a functional group reactive with amino resin (A) is used at less than 3 weight parts, cross-linking density easily becomes lower, and water resistance, hardness, and the like of the cured material comprised of the obtained water-borne resin composition are easily inferior. When more than 70 weight parts is used, the stability of water dispersed resin in emulsion polymerization easily

becomes inferior. Therefore, these cases are not preferable.

Brief Summary Text (106):

In order to control a molecular weight of the obtained copolymer in emulsion polymerization of unsaturated monomer components, it is possible to use chain transfer agents.

Brief Summary Text (115):

dimer type chain transfer agents such as .alpha.-methystyrene dimer, and the like. Moreover, in addition to these chain transfer agents, organic amines such as triethylamine, tributylamine, and the like; organic solvents such as carbon tetrachloride, acetaldehyde, and the like are used. Certainly, these compounds may be used alone, or in combinations of two or more.

Brief Summary Text (116):

Moreover, from the point of view of stability of polymerization, it is preferable to use surfactants, because emulsion polymerization is carried out in preparing the water dispersed resin (B).

Brief Summary Text (117):

There are no particular limitations placed on the surfactants, any usual surfactant used in emulsion polymerization can be used. Representative examples of the surfactants include

Brief Summary Text (120):

surfactants having unsaturated double bond therein, so-called reactive surfactants. and the like. There are no particular limitations placed on the amounts used of these surfactants. However, in general, the amounts used of surfactants in emulsion polymerization is suitable, that is, a range of approximately 0.2 to 10 weight parts against 100 parts of unsaturated monomer components is suitable.

Brief Summary Text (121):

Emulsion polymerization of unsaturated monomers is carried out by well-known and conventional methods. For example, the emulsion polymerization of unsaturated monomers can be carried out by using approximately 0.1 to 5 weight parts of initiator, approximately 50 to 1,000 weight parts of water, against 100 weight parts of unsaturated monomer component, and then polymerizing them at a temperature in a range of approximately 40 to 90.degree. C.

Brief Summary Text (122):

Moreover, the emulsion polymerization is carried out by using both the above initiator, and approximately 0.1 to 5 weight parts of reductants together at the same time, a so-called redox polymerization. In this polymerization, it is also possible to use compounds producing so-called multicharged metallic salt ions such as iron ion, copper ion, and the like as initiators together at the same time.

Brief Summary Text (124):

From the point of view of practical use, concerning with solid content in emulsion polymerization, it is preferable that the solid content of water dispersed resin (B) used in preparing water-borne resin composition of the present invention is approximately 10 to 70 weight %. Moreover, the unsaturated monomers, the initiators, and the reductants are added in well-known and conventional manners such as a batchwise, continuous dropwise, divisional adding, and the like.

Brief Summary Text (125):

Namely, many emulsion polymerization methods such as emulsifier free emulsion polymerization, seeded emulsion polymerization, microemulsion polymerization, power-feed method, shot growth method, and the like can be applied in addition to a popular emulsion polymerization. Moreover, water dispersed resin (B) can be obtained by mixing 2 or more kinds of water dispersed resins respectively obtained by emulsion polymerization.

CLAIMS:

7. Water-borne resin composition according to claim 4, wherein water-borne resin (B)

is water dispersed resin obtained by emulsion polymerization.

8. Water-borne resin composition according to claim 4, wherein water-borne resin (B) is obtained by emulsion polymerization of unsaturated monomers comprising unsaturated monomer having a functional group which can react with amino resin (A).

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L3: Entry 8 of 11

File: USPT

Dec 22, 1998

DOCUMENT-IDENTIFIER: US 5852124 A

TITLE: Rubber-modified styrenic resin composition

Brief Summary Text (22):

The butadienic rubber may be prepared by emulsion polymerization. A rubber latex having a number average particle size of 0.05 to 0.35 μm may be directly polymerized from monomers by an emulsion polymerization process. In an alternative, the monomers may be polymerized to form rubber latex having number average particle size of 0.05 to 0.20 μm firstly, which is then agglomerated to have a number average particle size of 0.22 to 0.35 μm by a freezing agglomerating method, a mechanical agglomerating method or an additive agglomerating method. The additives used in the additive agglomerating method are selected from acidic compounds, such as acetic anhydride, hydrochloric acid and diluted sulfuric acid, and inorganic salts, such as sodium chloride, potassium chloride, magnesium chloride, magnesium sulfate, and carboxyl group-containing polymeric agglomerating agents, such as methacrylic acid-butyl acrylate copolymer.

Brief Summary Text (26):

The rubbery graft copolymer is prepared by graft polymerization of 30 to 90 wt % of butadienic rubber and 70 to 10 wt % of a mixture of monomers. The mixture of monomers contains 50 to 90 wt % of styrenic monomer, 10 to 50 wt % of acrylonitrile monomer and/or methacrylate monomers, and 0 to 40 wt % of other copolymerizable monomers. The rubber graft copolymer is prepared by rubber graft polymerization from a mixture of monomers in the presence of a butadienic rubbery polymer so that a styrenic-acrylic based copolymer is chemically bonded to or grafted on the butadienic rubbery polymer. The degree of grafting is generally affected by several factors, such as the ratio of the monomer to the butadienic rubbery polymer, the polymerization conditions, the chemical properties of the butadienic rubbery polymer, the particle size, the addition rate of the monomers and the presence of a chain transfer agent. The polymerization may be emulsion polymerization, emulsion-bulk polymerization and emulsion-suspension polymerization. Emulsion polymerization is preferred.

Brief Summary Text (28):

Generally, the monomers and initiators may be added at one time or may be added continuously or incrementally during the graft polymerization. The initiator may be any of the conventional initiators for use in an emulsion polymerization process, for example, a peroxide, an azo or a persulfate compound. Examples of oil-soluble peroxide initiators are di-tert-butylperoxide, benzoyl peroxide, lauroyl peroxide, oleyl peroxide, cumene hydroperoxide and tert-butyl hydroperoxide.

Detailed Description Text (35):

200 parts by weight (dry weight) of the butadienic rubber latex (A1), 0.2 part by weight (dry weight) of α -methyl styrene dimer as a chain transfer agent, 0.32 part by weight of tert-butyl hydroperoxide, 0.2 part by weight of sodium formaldehyde sulfoxylate, 2 parts by weight of potassium oleate and 200 parts by weight of water were added in a nitrogen-charged reactor. 70 parts by weight of styrene and 30 parts by weight of acrylonitrile were then mixed and added continuously. Graft polymerization was carried out at 60.degree. C. for 8.5 hours to yield a rubbery graft copolymer (G9) having a conversion of monomer of 93.6%. The number average particle size of the butadienic rubber is 0.14 μm . The particle

size of the butadienic rubber is distributed in such a manner that 62.4% of the particles have a particle size of below 0.1 μm , 32.4% of the particles have a particle size of 0.1 to 0.25 μm , and 5.2% of the particles have a particle size of greater than 0.25 μm , all percentages being based on the total number of particles.

Detailed Description Text (45):

300 parts by weight (dry weight) of butadienic rubber latex (A1), 0.2 part by weight (dry weight) of α -methyl styrene dimer as a chain transfer agent, 0.32 part by weight of cumene hydroperoxide, 0.2 part by weight of sodium formaldehyde sulfoxylate, 2 parts by weight of potassium oleate and 200 parts by weight of water were added into a reactor under the presence of nitrogen. 60 parts by weight of styrene, 10 parts by weight of α -methyl styrene, 2 parts by weight of methyl methacrylate and 28 parts by weight of acrylonitrile were then mixed and added continuously. Graft polymerization was carried out at 60.degree. C. for 8.5 hours to yield a graft copolymer having a conversion of monomer of 93.6%. The number average particle size of the rubber is 0.14 μm . The particle size of the butadienic rubber is distributed in such a manner that, based on the total number of particles, 62.0% of the particles have a particle size of below 0.1 μm , 33.6% of the particles have a particle size of 0.1 to 0.25 μm , and 4.4% of the particles have a particle size greater than 0.25 μm .